By way of summary it may be said that our common hedge-mustard, having smoothish inflorescence and essentially glabrous pods, should be called *Sisymbrium officinale*, var. *leiocarpum*, DC., while the typical hairy-podded form, hitherto chiefly European in its distribution, proves to have been some years established in California and has now been found in Maine. It is therefore likely to be found elsewhere in our country.

Gray Herbarium.

TWO FERNS NEW TO THE FLORA OF VERMONT.

Clarabel Gilman.

The western half of Vermont is known as the home of rare and beautiful ferns, which grow among the mountains and upon the limestone rocks; but the portion east of the Green Mountains is not to be scorned by the student who delights in large and fine plants of the commoner ferns, as well as in new specimens of the rarer species. It was my good fortune last summer to find in the woods and on the hillsides of the town of Chester, Vermont, many unusually fine plants of some of the larger ferns, such as *Nephrodium spinulosum* and its variety *intermedium*, *Nephrodium Noveboracense*, *Athyrium filix-foemina* and *thelypteroides*, *Polystichum acrostichoides*, *Nephrodium marginale*, and *Struthiopteris Germanica*. *Woodsia Ilvensis*, *Asplenium ebeneum* and *Trichomanes*, and *Adiantum pedatum* are also among the natives of this region. Some fine specimens of *Botrychium lanceolatum* were gathered in a moist hollow on a hillside. Of course the common ferns of meadow, swamp, and pasture are found in Chester, as in most parts of New England. In all, 25 species and 6 varieties were gathered. But the special finds of the season were two varieties, one of which, so far as I have been able to learn, has not been previously reported in Vermont, and the other not in New England.

The first of these is Mr. Gilbert's variety *fructuosum* of *Nephrodium spinulosum*. The plants were first found August 18th. They grew around the base of a rock on the edge of a fine maple grove, and at once attracted attention by their richness and luxuriance of growth

and the unusual size of the fronds. The heavily fruited frond which was taken for pressing, when carefully examined, revealed glandular indusia covering the fruit-dots, but was so thick and heavy with its crowded pinnae that it could not be considered the variety *intermedium*. On referring to Waters's *Ferns*, it was found to correspond in all essential points with the description of the variety *fructuosum*, the principal part of which I quote: "Closely related to it (*N. spinulosum dilatatum*) is one more variety that has rather large sori, with glandular indusia, that form two lines on the smaller pinnules or on the lobes of the larger ones. The fronds are tripinnate below, bipinnate above. The stipes, which are one-third to one-half the entire length, are clothed sparingly with pale-brown ovate scales. . . . . This has been called variety *fructuosum* on account of the numerous sori." Dr. Robinson has since compared the fern with the forms of *N. spinulosum* in the Gray Herbarium, and has verified my identification of it as var. *fructuosum*. Waters says: "So far it has been collected only in New York and Connecticut, but it may prove to be of much wider range."[1]

Believing, then, that a careful search may bring it to light in other New England states, I think it worth the while to compare it more in detail with the type and the two more common varieties. It is distinguished from the type form of *N. spinulosum* by the greater length of the lower pinnae, the larger sori, and the glandular indusia. Moreover, while the pinnae are not set more closely upon the rachis, the greater length of the pinnules throughout nearly the whole frond causes the pinnae to overlap and produces the appearance of crowding.

Again, while the general outline of the frond is much like that of the variety *intermedium*, especially the unusually long and broad form of *intermedium* sometimes found, it is distinctly heavier and closer, and has thinner, paler brown scales on the stipe.

The new fern, however, is much more likely to be confused with the variety *dilatatum*, especially the forms of the latter with lengthened fronds. As in var. *dilatatum*, the pinnae are very broad and finely taper-pointed, and the lowest pair have the pinnules on the lower side considerably longer in proportion to those on the upper

[1] Since writing the above I have read in *The Plant World* for February, 1905, that this variety was collected by Dr. Waters at McCall's Ferry, Pennsylvania, during the Botanical Symposium held there last July.

side than in other forms of *N. spinulosum*, but the pinnae overlap more than in most, if not all, of the specimens of var. *dilatatum* that I have seen. Moreover, the glandular indusia and the very thin, pale brown scales are distingushing marks.

The other new fern, which is, however, much easier to recognize, is *Botrychium obliquum*, var. *Oneidense*, which, according to Waters, has been found before only in central New York, in the Catskills, and near Washington. It was growing in damp woods, like the typical form, but attracted notice by its blunter, clumsier appearance. It has shorter segments with fewer lobes, which are strongly rounded at the ends. The lower pinnae have each three pairs of these lobes besides a larger terminal one. The lobes look entire unless closely examined, when they are seen to be very faintly toothed. Only one plant was found, and of this only the sterile portion.

JAMAICA PLAIN, MASSACHUSETTS.

PARTHENOGENESIS IN ANTENNARIA.

R. G. LEAVITT AND L. J. SPALDING.

WE have observed every necessary step in the formation of embryos directly from egg-cells without fertilization in *Antennaria fallax* and *A. neodioica*. The flowers were carefully netted at a young stage and thus until the fruit was ripe were protected from pollen which might be brought from allied species or by a rare chance from the almost unknown male plants of the same species, either by insects or by winds. Microtome sections showed normal embryo-sacs and egg-apparatus and subsequent steps in the development of the embryo and endosperm; but no pollen tubes and no spermatic nuclei were seen. Details with drawings will be published later. Two other species under test conditions have shown embryo-formation, namely *A. canadensis* and *A. Parlinii*. Inasmuch as two American and one European species of *Antennaria* have now been shown to be parthenogenetic, the last named two may be assumed to behave in the same way; but this will soon be a matter of careful determination by us.

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